Geophysical Research Abstracts, Vol. 6, 06526, 2004
SRef-ID: 1607-7962/gra/EGU04-A-06526

AUTOMATIC REAL-TIME DETECTION AND LOCATION OF VERY LONG PERIOD EVENTS AT STROMBOLI

L. Dauria, F. Giudicepietro , M. Martini, W. De Cesare, G. Scarpato
INGV - Osservatorio Vesuviano (Naples) -Italy

Signals with Very Long Periods (VLP) (1-60s) have been recorded on many active volcanoes. They are related with various dynamical processes in the volcano feeding system. Stromboli was one of the first volcanoes where such signals have been observed and analyzed.
After the beginning of an anomalous eruptive activity in December 2002, a permanent broadband seismic network was deployed, by INGV-Osservatorio Vesuviano, in January 2003. Currently the network consists in 11 stations.
Seismic data are continuously acquired by the INGV-Osservatorio Vesuviano in Naples, where they are analyzed in real time and stored.
Preliminary results are immediately published on public web pages.
In this paper we focus on the method used for detecting and locating VLP events.
Such events have not a clear onset, so classical methods for automatic picking and location fails. Compared to common earthquakes signals, VLPs shows a high waveform coherence among different stations and a clear radial polarization toward the hypocenter.
Using these features, hypocenters may be found searching for the points in the space having the highest coherence in the radial component. This is quantified using a modified semblance function over band-pass filtered (2-20 s) signals. The point having the highest semblance function value is the hypocenter.
The semblance function is computed continuously for 10 s time windows over a regular grid centered on Stromboli, having a volume of 8000x8000x2000 m and a spacing of 100x100x50 m. VLP events are detected when the maximum value of the semblance function exceed a given threshold value.
This task require heavy computation efforts. For this reason we use a 64 processor

parallel computer for performing real-time analysis.